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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,368	08/15/2003	Richard Bajan	(49521) 59234	2534

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EXAMINER	
BAREFORD, KATHERINE A	
ART UNIT	**PAPER NUMBER**
1762	

DATE MAILED: 04/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/642,368	BAJAN, RICHARD	
	Examiner	Art Unit	
	Katherine A. Bareford	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) *32 and 33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31 and 34-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment of Jan. 31, 2005 has been received and entered.

Election/Restrictions

2. Applicant's election of Group I, claims 1-31 in the reply filed on Jan. 31, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

3. Claims 32-33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on Jan. 31, 2005.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 35 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

New claim 35 requires a stand off distance of between ".355 to 1.00 inches". This is new matter, because the only teaching in the specification or claims as originally filed is to .375 to 1.00 inch. See page 5, line 2, for example.

6. Claims 1-31 and 34-46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

All claims now require the substrate to have a "cold worked" surface layer, which is to be removed by the water jet. However, there is no indication in the specification or claims as originally filed or now as to what is required by a surface to have a "cold worked" layer. What treatment processes are encompassed by the term "cold working"? As a result, one of ordinary skill in the art would be unable to make and/or use the invention, because it would be unclear what substrates are encompassed by the invention or not.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-5, 9-11, 14, 38, 40 and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0 750 054 A1 (hereinafter '054) (as provided by applicant).

Claims 1, 10, 46: '054 teaches a method of applying a metallurgical coating to a superalloy substrate. Page 2, lines 35-45 and page 6, lines 40-50. The substrate can have a cold worked surface layer, to the extent that a grit blasting procedure can be done to the surface (which would be method of "cold working") prior to the later treatment. Page 4, lines 5-10 and page 6, lines 5-20. The surperalloy would inherently have an underlying grain structure. A water jet of sufficient pressure is directed against the substrate while traversing the surface at an effective sweep rate to modify the surface morphology of the substrate. Page 5, lines 25-45. This water jet treatment will remove the cold worked surface layer of the substrate and expose the underlying grain structure of the superalloy. Page 3, lines 35-45, page 5, lines 25-45 and page 6, lines 5-20 (note the greater erosion of the water jet will erode away the initial grit blasted surface). A metallurgical coating can be deposited on the modified surface of the substrate by high velocity oxygen fuel spray. Page 6, lines 40-50 and page 8, lines 34-35.

Claim 2: the coating would have a thickness, which meets all the features of these claims since the coating can be up to and in excess of 0.5 inches. Page 6, lines 40-50.

Claim 3, 10: the surface can be grit blasted to increase the surface roughness prior to treating the surface with a water jet. Page 4, lines 5-10 and page 6, lines 5-20.

Claims 4-5, 11: the coated substrate can be heat treated in a vacuum. Page 6, lines 40-50.

Claim 9, 14: the metallurgical coating can be an M Cr Al Y coating, where M is Co or Ni. Page 6, lines 40-50.

Claim 38, 40: the pressure of the water jet can be 50 ksi (52000 psi). See page 5, lines 25-45.

9. The rejection of claims 1-2, 4-5 and 9 under 35 U.S.C. 102(b) as being anticipated by Taylor et al (US 5743013) is withdrawn due to applicant's Jan. 31, 2005 amendments.

10. The rejection of claims 1-2 and 4-5 under 35 U.S.C. 102(b) as being anticipated by Berry et al (US 6571472) is withdrawn due to applicant's Jan. 31, 2005 amendments.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 7, 34-27, 39 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 750 054 A1 (hereinafter '054) (as provided by applicant).

'054 teaches all the features of these claims, as discussed in the 35 USC 102(b) rejection above, except the pressure of the water jet (claim 7), the sweep rate (claims 34), the stand off distance (claim 35, 39, 41). '054 teaches that the jet has a step distance of 0.03 inches, for example. Page 5, lines 25-30. '054 teaches that the orifice size can be 0.016 inches. Page 5, lines 25-30.

However, '054 does teach the water jet can operate at 50 kis (50,000 psi). Page 5, lines 30-35. '054 only requires that the water jet operates at a pressure of at least 28 ksi. Page 8, lines 10-15. '054 also teaches a traverse rate of 30.5 cm/min and that the nozzle traverse rate can be increased to provide the desired erosion. Page 5, lines 35-40.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '054 to perform routine experimentation to optimize the water jet pressure, standoff distance and traverse rate in order to provide a desirably roughened surface, given that '054 teaches experimental operating pressures of a water jet, standoff distances and traverse rates and indicates that the various features can be adjusted to adjust the desired erosion rate and amount.

13. Claims 6 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over '054 as applied to claims 1-5, 9-11, 14, 38, 40 and 46 above, and further in view of Arnold et al (US 5956845).

'054 teaches all the features of these claims, including heat treatment, except that the heat treatment includes hot isostatic pressing.

However, Arnold teaches applying a thermally sprayed coating to a metal substrate, such as a turbine blade. Column 1, lines 10-30 and column 11, lines 30-68. A roughened substrate can be provided. Column 4, lines 40-50. A desirable coating is then applied to the workpiece substrate by HVOF spraying. Column 4, lines 40-65. After the coating is applied a desirable bond to the substrate is provided by subjecting the coated workpiece substrate to hot isostatic pressing. Column 5, lines 5-15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '054 to perform hot isostatic pressing of the coated substrate as suggested by Arnold in order to provide a desirably coated and bonded surface, because '054 teaches coating a substrate such as a turbine blade by thermal spraying and Arnold teaches that when coating a substrate such as a turbine blade by thermal spraying it is desirable to heat treat the coated substrate by hot isostatic pressing in order to provide a desirably bonded coating.

14. Claims 8 and 13 rejected under 35 U.S.C. 103(a) as being unpatentable over '054 as applied to claims 1-5, 9-11, 14, 38, 40 and 46 above, and further in view of WO 02/40745 (hereinafter '745).

'054 teaches all the features of these claims except depositing a platinum aluminide metallurgical coating onto the surface of the substrate.

However, '745 teaches applying a thermally sprayed coating to a gas turbine components. See page 1, lines 1-5 and page 9, lines 15-25. A bond coating can be applied to the substrate by thermal spraying. Page 6, lines 10-25, page 9, lines 15-25 and page 10, lines 5-10. The bond coating can be platinum aluminide or a M Cr Al Y. Page 6, lines 10-20, page 9, lines 15-25 and page 10, lines 5-10.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '054 to use a platinum aluminde bond coating as suggested by '745 in order to provide a desirable coating, because '054 teaches that a thermal spray coating can be applied and that the thermal spray coating can be a M Cr Al Y type coating applied by thermal spraying and '745 teaches that when applying a bond coating by thermal spraying it is desirable to use M Cr Al Y or platinum aluminide.

15. Claims 15, 16, 18, 19, 22, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over '054 as applied to claims 1-5, 9-11, 14, 38, 40 and 46 and also 7, 34-37, 39 and 41 above, and further in view of Darolia (US 6607611).

'054 teaches all the features of these claims except roughening the surface of the applied coating (the M Cr Al Y bond coating) and then applying a second coating (a ceramic coating).

However, Darolia teaches applying a thermally sprayed bond coating to a metal substrate, and then applying a thermally sprayed, such as by plasma spraying, ceramic coating. Column 1, line 60 through column 2, line 25, column 5, line 55 through column 6, line 5 and column 15-30. The bond coating can be a M Cr Al X (where X can be yttrium) coating. Column 5, lines

55-65. The bond coating is roughened prior to applying the ceramic coating. Column 6, lines 10-20. Then a ceramic coating, which can be zirconia stabilized with 4-8 wt% yttria, is applied by plasma thermal spraying. Column 6, lines 10-20.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '054 to roughen the applied bond coat and then applying the ceramic coating as suggested by Darolia in order to provide a desirably bonded coating system, given that '054 teaches applying a bond coat material and Darolia teaches that after applying a bond coat material, it is desirable to further apply a ceramic top coat, and to also roughen the bond coat before applying the top coat. It would further have been obvious to perform this roughening by the water jet method of '054, because Darolia teaches that the bond coat can be roughened by a method such as grit blasting, and '054 provides benefits of using a water jet rather than grit blasting when roughening a surface prior to coating.

16. Claim 17, 21, 23-27, 29-31 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over '054 in view of Darolia as applied to claims 15, 16, 18, 19, 22 and 42-43 above, and further in view of Arnold et al (US 5956845).

'054 in view of Darolia teaches all the features of these claims, including heat treatment, except (1) that a three layer coating system is used, and (2) that the heat treatment includes hot isostatic pressing and is prior to the second layer application (claim 23, 30, 31).

However, Arnold teaches applying a thermally sprayed coating to a metal substrate, such as a turbine blade. Column 1, lines 10-30 and column 11, lines 30-68. A roughened substrate can be provided. Column 4, lines 40-50. A desirable coating is then applied to the workpiece substrate by HVOF spraying. Column 4, lines 40-65. After the coating is applied a desirable bond to the substrate is provided by subjecting the coated workpiece substrate to hot isostatic pressing. Column 5, lines 5-15. The coating of Arnold provides for a method of repairing a substrate such as a turbine blade by coating with a metal alloy of the same material as the substrate so as to build the substrate back to its original dimensions. Column 11, lines 15-68.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '054 in view of Darolia to provide a repair of a substrate, by coating an initial layer of material the same as the substrate and including performing hot isostatic pressing of the initially coated substrate, before applying the bond coating and ceramic top coating as suggested by Arnold in order to provide a desirably repaired, coated and bonded surface, because '054 in view of Darolia teaches coating a substrate such as a turbine blade by thermal spraying with a bond coat and ceramic top coat and Arnold teaches that it is desirable to repair a turbine blade by coating an initial layer of material the same as the substrate and including performing hot isostatic pressing of the initially coated substrate. This would provide the application of a first metal layer with hot isostatic pressing to repair the substrate, followed by a second metal layer of bond coat, followed by a third ceramic layer in order to protect the repaired substrate.

17. Claims 20, 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over ~~Taylor~~ '054 in view of Darolia and Arnold as applied to claims 17, 21, 23-27, 29-31 and 44-45 above, and further in view of WO 02/40745 (hereinafter '745).

'054 in view of Darolia and Arnold teaches all the features of this claim except depositing a platinum aluminide metallurgical coating onto the surface of the substrate.

However, '745 teaches applying a thermally sprayed coating to a gas turbine components. See page 1, lines 1-5 and page 9, lines 15-25. A bond coating can be applied to the substrate by thermal spraying. Page 6, lines 10-25, page 9, lines 15-25 and page 10, lines 5-10. The bond coating can be platinum aluminide or a M Cr Al Y. Page 6, lines 10-20, page 9, lines 15-25 and page 10, lines 5-10.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '054 in view of Darolia and Arnold to use a platinum aluminde bond coating as suggested by '745 in order to provide a desirable bond coating, because '054 in view of Darolia and Arnold teaches that a bond coating can be applied and that the bond coating can be a M Cr Al Y type coating applied by thermal spraying and '745 teaches that when applying a bond coating by thermal spraying it is desirable to use M Cr Al Y or platinum aluminide.

18. The Examiner notes that Dietrich et al (US 2004/0043261) is the national state application of WO 02/40745 cited above.

Response to Arguments

19. Applicant's arguments with respect to claims 1-31 and 34-46 have been considered but are moot in view of the new ground(s) of rejection.

As applicant has amended the claims to provide for the cold working and removal to expose the underlying grain structure, the Examiner has use the new reference to '054 as to this issue.

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KATHERINE BAREFORD
PRIMARY EXAMINER